

Spawning aggregation of *Melibe viridis* Kellaert (1858) from Gulf of Kachchh – Western India

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Abstract- Opisthobranchs are the least studied group of animals in the phylum Mollusca in context to the Indian subcontinent. They are one of the best indicators of the reef resilience. *Melibe viridis* Kellaert (1858) belonging to subclass Opisthobranchia has been recorded from the reefs of Gulf of Kachchh only in the west coast of India. The current paper describes the first record of spawning aggregation of the species in the Gulf of Kachchh in the western India.

Index Terms- Opisthobranchs, Mollusca, *Melibe viridis*, Gulf of Kachchh, Western India, Spawning aggregation

I. INTRODUCTION

Opisthobranchs commonly known as sea slugs are among the least studied group in the taxonomy of the marine molluscs. In the west coast of India, the state of Gujarat has 1650 km long coast line having major coastal ecosystems like coral reefs, mangroves, sandy beaches, inter tidal mudflats and rocky shores. Studies on the opisthobranch fauna of Gulf of Kachchh are limited to a few publications by Eliot (1909a,b), Gideon *et al.* (1957), Burn (1970), Menon *et al.* (1970), Narayanan (1969, 1970, 1971a,b), Rudman (1980), Deomurari (2005) and Apte *et al.* (2010). The most comprehensive work on the opisthobranchs of the Gulf of Kachchh was that by Narayanan (1969) and Apte *et al.* (2010).

Melibe viridis (Kellaert, 1858) is a nudibranch gastropod (suborder: Dendronotia family: Tethydidae) with a wide distribution in the Indian and Western Pacific Oceans (Cattaneo-Vietti & Thompson, 1989; Gosliner and Smith, 2003; Zenetos *et al.* 2003). The species was first described as *Meliboea viridis* Kellaert (1858) but this description was ignored by subsequent authors who reported it. The revision by Gosliner and Smith (2003) considers all these names (*Meliboea viridis* Kellaert (1858), *Melibe fimbriata* Alder & Hancock, 1864 *Melibe*

vexillifera Bergh, 1880 *Promelibe mirifica* Allan, 1932 *Melibe japonica* Eliot, 1913) synonyms of *Meliboea viridis* Kellaert (1858) and suggests retaining the name *Melibe viridis* (Kellaert, 1858).

Distribution of the species: Known from the Indian and Western Pacific Oceans from Mozambique, Zanzibar, Sri Lanka, India, Vietnam, Japan, Philippines and Australia. In the Mediterranean Sea it is found from Greece (Gosliner & Smith 2003). The record of *M. viridis* on the west coast of India is only from Gujarat coast which dates back in 1909 by Hornell and Eliot. However after that it was not reported till 2005 when Deomurari reported three specimens from the Bay of Poshitra. For rest of the India, this species is reported from Mandapam (Sundaram, 1969). In the recent studies of March 2011, however, authors have recorded spawning aggregation of 48 individuals and 22 egg ribbons in 3 transects of 50 x 2 meters each.

II. MATERIALS AND METHOD

The present study included opportunistic data collection during biodiversity assessment surveys and other studies of the coral reefs in the Gulf of Kachchh, by the authors in the year 2010. Specimens were observed on the reef of Boria (Fig. 1) in the Gulf of Kachchh. The reef is protected as Marine National Park. This reef is dominated by the sandy and rubble patches intercepted with massive corals. 3 Belt Transects (Sutherland, 1997) of the length of 50 meter x 2 meters were used to determine the target species density. The Geo-coordinates were recorded using Garmin E-trex ultra model GPS. The length of the species was estimated using vernier- calipers. The photographs were taken using Intova 7 mp digital camera with its underwater housing. Basic calculations were carried out using Prism software ver.3.0



Fig 1: Study site Boria reef in the Gulf of Kachchh.

III. RESULTS AND DISCUSSION

The species was recorded from Boria reef (22°24'53"N 69°13'19"E) in the South-western Gulf of Kachchh. The reef mostly remains submerged during regular low tide. It is only during the negative tides that the reef gets fully exposed. The substrate is dominated by the deposition of rubbles on the reef covering more than 30 % of the reef and at some places extending to 80% (Transect 2). The species has tan ground colour with yellowish ting. Body elongated, with translucent appearance. Internal organs are visible. Cerata are thick, elongated and broad. The number of cerata ranged from 5 to 7. The taxonomic account of the species is as follows,

Phylum: Mollusca

Class: Gastropoda

Subclass: Opisthobranchia

Order:

Suborder:

Family: Tethydidae

Genus: *Melibe*

Species: *viridis* Kellart (1858) (figure 2)

Synonyms of the species: *Meliboea viridis* Kelaart (1858)

Melibe fimbriata Alder & Hancock, 1864,

Melibe vexillifera Bergh, 1880

Promelibe mirifica Allan, 1932

Melibe japonica Eliot, 1913

Nudibranchia
Dendronotina



Figure 2: *Melibe viridis* Kellart (1858) at Boria reef

48 individuals in 3 transects of 50 meters were recorded along with 22 egg ribbons suggesting massive spawning aggregation. In any of the studies carried out in the Gulf of Kachchh (Eliot 1909a,b), (Gideon *et al.* 1957), (Burn 1970), (Menon *et al.* 1970), (Narayanan 1969, 1970, 1971a,b), (Rudman 1980), (Deomurari 2005), including the most recent studies (Apte *et al.* 2010) the species has not been reported till date. The studies carried out by Alder and Hancock (1864) reported the species *M. fimbriata*. Eliot (1909a, b) suggested the presence of *M. rangii*, Bergh with a probability of *M. fimbriata*, Alder & Hancock from Okha reef. In the study of Eliot (1909a, b) the

specimen length is recorded 80 to 100 mm, whereas in the current study maximum length was recorded to be 120 mm. In any of these studies the spawning of the genus *Melibe* has not been mentioned. The study by Mastrototaro *et al.* (2004) in the mediterranean sea recorded at least ten specimen in spawning condition with maximum length of 60 to 143 mm of the specimen. The current study carried out in the Gulf of Kachchh significantly describes the mass spawning aggregation of *Melibe viridis* Kellart (1858) with an average ratio of 2:1 specimen and egg ribbon, in the Gulf of Kachchh in the western part of India for the first time.



Figure 3: Egg ribbon of *Melibe viridis* Kellart (1858)

Table 1: Numerical data collected for the observation

Transect No	Total Individuals recorded	Density / m ²	No. of Egg ribbons	Max. Length of the individual in given transect
T – 1	14	0.14	8	120 mm
T – 2	23	0.23	11	110 mm
T – 3	11	0.11	3	98 mm
Total	48		22	

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